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Employment Status, Depression, Drinking and Alcohol Use Disorders in Puerto Rico

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Abstract

Background—To examine the association between employment status, depression, drinking, binge drinking, and DSM-5 alcohol use disorder in Puerto Rico.

Methods—Data are from a 2013-2014 household random sample of individuals 18-64 years of age in San Juan, Puerto Rico.

Results—Bivariate analyses showed that depression was 5 times higher among unemployed males than among those employed fulltime (21% versus 4%), and 2 times higher among unemployed females compared to those employed part-time or fulltime (18% versus 7% and 9%). Employment status was not associated with weekly volume of drinking, but non-participation in the workforce was protective against drinking (OR=2.17; 95CL: 1.03-4.57; $p<.05$) and binge drinking (OR=.62; 95CL=.39-.97; $p<.05$). This association could be due to the fact that those not in the work force may not be working due to sickness or disability. Male gender was a factor of risk for being a current drinker (OR=2; 95CL=1.53-2.6; $p<.001$) and binge drinking (OR=1.69; 95CL=1.29-2.2; $p<.001$). Male gender was protective against depression (OR=.32; 95CL=.14-.73; $p<.05$), but males employed only part-time were almost 5 times more likely than females employed fulltime to be depressed (OR=4.66; 95CL=1.25-17.38; $p<.05$).

Conclusions—Employment status in Puerto Rico is associated with depression and with current drinking, but not with other alcohol-related outcomes. Perhaps Puerto Rico is a “wet” environment, where drinking is already at a relatively high level that is not affected by employment status. Perhaps the chronic high rate of unemployment in the island have also created familial (e.g. support) and personal level accommodations (e.g., participation in the informal economy) that do not include increased drinking

Keywords

employment status; depression; drinking; Puerto Rico

Introduction

The overall objective of this paper is to examine the association between unemployment, drinking, and depression in San Juan, Puerto Rico. As a background, Puerto Rico, which has been a U.S. Commonwealth since 1953, has had a relatively high unemployment rate for many years. For instance, the unemployment rate was relatively stable from 2001 (10.4%) to 2008 (11.4%), and then rose to 16.9% in March 2011 (U.S. Bureau of Labor Statistics, 2010). In June 2010 the unemployment rate in Puerto Rico was 16.6%, that is 1.7 times higher than the rate on the U.S. mainland at the time (9.6%) (U.S. Bureau of Labor Statistics, 2010). When both unemployment and underemployment (works less than 35 hours per week and wishes to work more) are considered, the proportion of people affected in Puerto Rico rose from 19% in 2004 to 28% in 2009, while in the U.S. the corresponding rates were 11% and 15%. The 2009 rate in Puerto Rico indicates that almost 3 persons in 10 were unemployed or underemployed on the island at that time. Recently (June 2015), the unemployment rate in Puerto Rico was 12.6% (<http://www.bls.gov/eag/eag.pr.htm>, accessed on 7/28/2015).

The alcohol literature is controversial on whether unemployment is associated with higher levels of drinking. Most individual level studies report that unemployment is associated with an increase in drinking and binge drinking (Janlert and Hammarström, 1992; Dooley and Prause, 1998; Dee, 2001; Mossakowski, 2008; Nandi et al., 2013). This may be particularly true of longer unemployment (Khan et al., 2002; Mossakowski, 2008), involuntary unemployment, independent of length, and underemployment (Dooley and Prause, 1998; Ettner, 1997; Khan et al., 2002). Also, not all dimensions of drinking seem to be equally affected by employment levels. For instance, Bor et al. (2013), with particular reference to the 2007-2009 recession in the U.S., reported both a decline in any consumption of alcohol and an increase in frequent binge drinking (4 or more times in the past 30 days). The increase in binge drinking was higher among younger unmarried non-Black men who recently became unemployed. Kerr et al. (2014) also reported variation in drinking across demographic groups as a response to the great recession. Trend analyses of national survey data for 2009-2010 showed that those under age 25 in 2009-2010 drank less than those in the 2000 and 2005 surveys, while those in their 30s and 40s drank more through increases in heavy drinking occasions. Zembre et al. (2013), also analyzed national survey data to assess the impact of the great recession on drinking and problems among Whites, Blacks and Hispanics. Their analysis indicated that in the face of severe economic loss (loss of job or housing) Blacks were more likely than Whites to report the presence of 2 or more alcohol problems and that Blacks and Hispanics were more likely than Whites to report DSM-IV dependence.

Results from aggregate level studies are less uniform than those from individual level studies (Catalano et al., 2011). For instance, analyzing data for the U.S., Davalos et al. (2012)

reported that changes in a state's unemployment rate are positively associated with changes in binge drinking, alcohol-involved driving, and alcohol abuse and/or dependence in that state. According to Davalos et al. (2012) a 1% increase in a state unemployment rate will lead to an increase of approximately one binge drinking day per year, a 1.35 greater odds of alcohol-involved driving, and 1.2 greater odds of alcohol abuse and/or dependence among individuals in that state. Rhum (1995) on the other hand found that alcohol consumption is procyclical: Rising unemployment rates lower drinking, with spirit consumption being more affected than beer or wine consumption.

Various mechanisms have been proposed to explain the association between unemployment and drinking. Curiously, according to Catalano et al. (2011), stress has been used both to explain increases and decreases in alcohol consumption. Loss of job, the consequent loss of income and the associated uncertainty of how to support oneself and one's family would lead to increased use of alcohol to mitigate stress and maybe depression. However, loss of job could also free individuals from stressful job related situations, which would then minimize the need to use alcohol as a stress-relief mechanism. Decreases in drinking associated with recession and unemployment are also explained by loss of income resulting from unemployment. Economic downturns can also make people less willing to socialize, go to bars and parties, thus decreasing social situations where drinking would occur. However, drinking behavior during difficult economic times may simply lead drinkers to adapt by shifting the places of drinking (on premise to off premise), and consuming cheaper alcohol. Finally, drinking is a complex behavior and so are individuals' reactions to the consequences of economic downturns such as unemployment or unfavorable changes in employment status. These associations are made more complex because, as Burgard et al. (2013) suggest, some of the disagreement in the literature may be because the effect of unemployment and other economic hardships may differ between recession and non-recession periods. For instance, in non-recession periods more people may lose their jobs for just-cause than in recession periods. Not surprisingly, people's reactions to job loss, whether they will increase or decrease their drinking in response to loss job, could also be different in non-recession versus

Previous research has also identified a high rate of depressive disorders among the unemployed and among Puerto Ricans. In Mossakowski's (2009) analyses of the National Longitudinal Survey of Youth, unemployment was significantly associated with depression independently of sociodemographic background, socioeconomic status, family background and prior depressive symptoms. Dooley et al.'s (2000) analysis of panel data from the same survey showed that shifts from adequate employment to inadequate unemployment (involuntary part-time or low age) or from employment to unemployment were associated with higher rates of depression. Among Puerto Ricans, previous research has described higher than expected rates of depression (Alegria et al., 2007; Ortega et al., 2006), suicidal ideation and suicidal attempts (Fortuna et al., 2007) This is also true of unemployed Puerto Ricans (Potter et al., 1995; Vera et al., 1991). Potter et al's analysis showed a rate of depression 1.8 times higher among unemployed than among employed Puerto Ricans in New York city (35.6% versus 20%). Vera et al. reported a rate of 28.6% for Puerto Ricans in Puerto Rico and an association with unemployment that remained significant after controls for gender, education, and income.

Following this research background, this paper examines the association between employment status and depression and employment status and the following specific drinking outcomes: current drinker status, volume of drinking (mean number of drinks consumed per week), and binge drinking. It is possible, as seen in the literature reviewed above (e.g., (Bor et al., 2013) that certain employment statuses, such as unemployment, will affect some alcohol outcomes but not others, as well as affect different alcohol outcomes differently. The overall expectation to be tested is that unemployment will be positively associated with depression, with a higher volume of drinking, binge drinking, and DSM-5 alcohol use disorder (AUD). Bivariate analyses will be stratified by gender because of classical and persistent differences in drinking between men and women (Dawson et al., 2015). The effect of other factors that have been associated with drinking such as age, marital status, education, income, and religion will also be controlled for in the analyses. Finally, given indications in prior research of potential modification of the association between unemployment and drinking by age, all multivariate analysis will test for the effect of an employment status by age interaction.

Methods

Sample and data collection

Interviews were conducted with 1,510 residents of the metropolitan area of San Juan between May 2013 and October 2014. San Juan was selected as the area for interviews because it is the capital and the largest city on the island. San Juan is also a dense urban area; household sampling in the area would thus involve less interviewer travel, which served to contain expenses. Finally, based on prior research, there was no reason to believe that drinking patterns in San Juan would not represent Puerto Rico as a whole. Respondent selection followed a multistage cluster sampling procedure, with 220 Primary Sampling Units represented by Census Block Groups. Each selected Block was divided into segments of 10 households, with a segment then randomly selected in each Block. Selected households were approached by trained interviewers who, after screening for eligibility, listed all eligible household members in a pre-prepared interview list form. Interviews were then carried out with a household member randomly selected from the list using a Kish table. Eligibility was based on age (18-64 years), ability to speak Spanish, no incapacitating cognitive impairment, and self-identification as Puerto Rican. The response rate for the survey was 83%. Trained interviewers conducted Computer Assisted Personal Interviews at the respondents' home that lasted about 1 hour. The pre-programmed questionnaire was originally developed in Spanish by the fieldwork research team led by the Puerto Rican and U.S. Principal Investigators (GC, RC), all Spanish-speaking. Respondents received a \$25 incentive for participation and provided written informed consent. The survey was approved by the Committee for the Protection of Human Subjects of the University of Texas Houston Health Science Center and the University of Puerto Rico.

Measurements

Drinkers: All respondents who reported drinking any alcohol in the past 12 months were categorized as drinkers.

Binge drinking: This was defined as drinking 4 or more (women) or 5 or more (men) standard drinks per occasion (within 2 hours) in the past 12 months. A standard drink was defined as a 5 ounce glass of table wine, a 12 ounce can of beer or a 1.5 ounce shot of spirits. The variable representing binge drinking is a dichotomy with respondents divided into those who reported any binge drinking in the past 12 months and those who did not report this type of drinking (reference group) including abstainers

Average drinks per week: This was based on the self-reported frequency and quantity (in standard drinks) of drinking any type of alcohol, and was estimated using the “graduated frequencies” method (Clark and Hilton, 1991). Values for this variable ranged from 0 (abstainers) to 91 drinks per week. The overall value for this variable is based only on respondents who were classified as drinkers. This is because inclusion of abstainers in the estimation of this average would reduce it considerably and potentially misrepresent the amount of drinking done by respondents in the sample. For a more detailed description of the graduated frequencies approach to measurement, see Greenfield and Kerr (2008).

Alcohol use disorder: Alcohol use disorder was based on DSM-5 criteria for alcohol use disorder (AUD) (American Psychiatric Association, 2013) and implemented with the Spanish version of the World Health Organization’s Composite Diagnostic Interview (CIDI). The instrument was translated from English and adapted for use in Spanish speaking populations using a conceptual model that focused on cross-cultural equivalence in 5 dimensions (semantic, content, technical, criterion and conceptual equivalence) following a cultural adaptation model described by Alegria et al. (2004). The Spanish version of the instrument has adequate concordance in clinical reappraisal studies with the Structured Clinical Interview for Axis 1 Disorders (SCID) ($\kappa=.51$; specificity=.82 for lifetime substance use disorders and .67 for major depressive episode)(Alegria et al., 2009). According to DSM-5 criteria, respondents reporting the presence of any 2 or more indicators of the 11 indicators in the criteria during the 12 months prior to the interview were identified as positive for DSM-5 AUD.

Depression: This was identified with the Patient Health Questionnaire 9 (PHQ-9), a 9-item screen for depression in the past two weeks that has been intensively studied including research supporting administration in Spanish, and use with ethnically diverse populations (Spitzer et al., 1999; Pinto-Meza et al., 2005; Zhong et al., 2014). A cutoff of 10 is recommended to indicate a depressive episode. This cutoff point has sensitivity and specificity levels of 88% for major depression (Kroenke, 2002). Internal and test-retest reliability are good (.89 and .84, respectively: Spitzer et al., 1999). Internal consistency in the data set under analysis as measured by Cronbach’s alpha is .86.

Sociodemographic variables: *Age.* The age of respondents was used as a categorical variable: 18-29, 30-39, and 50 years and older (reference). *Income.* Respondents were asked to identify the category into which their total household income fell from a list of 12 categories, beginning with <\$4,000 ending with a highest category of >\$100,000. For the present analyses, respondents’ income was grouped into less than \$10,000 (reference), \$10,001 to \$20,000, \$20,001 to \$30,000, \$30,001 to \$40,000, \$40,001 to \$60,000, and

\$60,001 and more. *Employment status.* This variable represents respondents' employment status at the time of the interview. Respondents were categorized into 4 employment categories: a) Employed part-time; b) Employed full-time (35 or more hours of work per week; reference); Unemployed (unemployed, and looking for work); c) Not in the workforce (retired, homemaker, never worked, unemployed and not looking for work, students). There were too few respondents categorized as under-employed (employed part-time but wants to work more) to form a separate category. These respondents were classified as part-time. *Level of education.* Respondents were categorized into 4 education categories: a) less than high school; b) completed high school or GED; c) some college or technical or vocational school; d) completed 4-year college or higher (reference group). *Marital status.* A 4 categories variable as follows: a) Married or living with someone, b) separated or divorced, c) widowed, d) never married/single (reference). *Religion.* This variable had 4 categories: a) Protestant, b) no religious preference, c) Catholic (reference), d) other.

Statistical analyses—To take into account the multistage, multicluster design used in the survey sampling frame, all analyses were conducted using the Stata 14.0 “svy” command (Statacorp., 2015). Analyses were conducted on data weighted to correct for unequal probabilities of selection into the sample. In addition, a post-stratification weight was applied, which corrects for nonresponse and adjusts the sample to known population distributions on certain demographic variables (age and gender). The first step in the analyses consisted of bivariate crosstabulations (Tables 1 and 2) which included chi-square tests to detect statistically significant associations between employment status and the drinking outcomes. As stated above, the analysis of the average number of drinks consumed per week included only drinkers. Significance was tested with an adjusted Wald test. Multivariate analyses were used as a second step, and included both ordinary least squares regression and logistic regression, depending on the outcome under focus. Logistic regression (Table 3) was used to assess the association between employment status and the following outcomes: depression, current drinker status, binge drinking in the past year, binge drinking at least once a month in the past year, past 12 month DSM-5 AUD. Ordinary least squares regression (Table 4) was used to examine the association between employment status and the number of drinks consumed per week (logarithmic transformation). Covariates in all multivariate analyses were gender, age, family income, education, marital status, and religion. Multicollinearity between sociodemographic covariates was tested in two steps. First, correlations between sociodemographic variables were estimated, with results showing that none was above .5. Second, variance inflation factors for the independent variables in the regression in Table 4 were computed using Stata command “estat vif”. Results showed that VIF values ranged from 1.08 to 3.51, and the mean VIF was 2.8. Rules of thumb for the interpretation of these values suggest that multicollinearity is not present (no value is larger than 5). Widowers (n=31) were dropped from the logistic analysis of binge once a month in the past 12 months because of zero respondents with a positive answer on this outcome. The logistic regression with DSM-5 AUD was run while controlling for the above sociodemographic covariates plus volume of drinking and binge drinking. Because results in Tables 1 and 2 indicated gender specific associations with many of the outcomes in those tables, all multivariate analyses were conducted with a test of a gender by unemployment interaction. This interaction was only significant for depression. All other models therefore

show results for main effects only. Finally, and employment by age interaction was tested in all multivariate models, but the results were not statistically significant for any of the outcomes being examined.

3. Result

Sample description

The mean age of respondents was approximately 40 years (data not shown). Slightly over half (53%) of the sample were women. Approximately 37% of respondents were married and/or cohabitating. Respondents were primarily Catholic (51%) and just over a quarter were Protestant (26%). The educational level of respondents was relatively high, with 43% reporting some type of college degree. Only 8% reported never having received a high school diploma. Roughly half (48%) of respondents reported being employed to their satisfaction in either a part- or full-time position: 13% reported being unemployed and 12% reported under-employment. The mean household family income was \$23,062 (median income: \$15,360).

Bivariate Analysis: Depression, drinking status, binge drinking, and DSM-5 AUD by employment status

Among men, the mean number of drinks consumed per week was higher among the unemployed (14.6), followed by men employed part-time (14.1), followed by men employed full time (12.2) and men not in the workforce (8.5) (data not shown; Adjusted Wald Test: $F=3.38$; $p<.01$). Employment status is also associated with depression (Table 1). Men who are unemployed have a rate of depression 5 times higher than the rate among those employed fulltime, and 2 times higher than the rate among those not in the workforce. In contrast, current drinking status, binge drinking in the past 12 months, the mean number of drinks consumed per week, and DSM-5 AUD do not show a statistically significant association with employment status in this crosstabulation.

Among women, employment status is not associated with the mean number of drinks consumed per week (data not shown). Unemployed women consume 5.4 drinks per week on average, women employed part time and those employed fulltime consume 6.1 drinks, and women not in the workforce consume 6.4 drinks (adjusted Wald test, $F=.12$; $p: ns$). Depression is also associated with employment status (Table 2). Women who are unemployed and those not in the workforce have a rate of depression that is 2 to 3 times higher than women who are employed full or part-time. Current drinking is also associated with employment status. Women not in the workforce and unemployed women have lower rates of current drinkers than those who are employed full or part-time. Binge drinking in the past year and DSM-5 AUD in the past 12 months are not associated with employment status among women.

Multivariate analyses: employment status, current drinking status, and binge drinking

Employment status is associated with current drinking (Table 3). Those not in the work force are less likely to be current drinkers than those who are employed. The same is true for those who are Protestant versus Catholic, those who have less than high school education and

those with a high school diploma versus those who completed college. Those who never married are 1.6 times more likely to be drinkers than those who are married, and those who are older than 30 years of age are less likely to be drinkers than 18-29 year olds. Men are about two times more likely to be drinkers than women.

Employment status is not associated with binge drinking in the past 12 months, but being a Protestant compared to a Catholic, and being older than 40 years of age compared to being 18-29 years are protective against binge drinking. Men are more likely than women to be binge drinkers.

Multivariate analyses: employment status and the average number of drinks consumed per week

Results from OLS regression show that employment status is not associated with the average number of drinks consumed per week (Table 4). Being a Protestant is negatively associated with weekly volume of drinking, but having no religion is a factor of risk compared to being a Catholic. Those who never married are also at risk compared to those who are married the same happening with men compared to women.

Multivariate analyses: employment status and depression

Results from the multivariate analyses show that those not in the workforce are about two times more likely than those employed fulltime to be depressed (Table 5). However, gender modifies the effect of unemployment on depression. Although the main effect of male gender is protective against depression, unemployed males and those who are employed part-time are 3 and more than 4 times more likely, respectively, than employed females (reference) to be depressed. However, the effect for unemployed males is borderline significant ($p < .053$) Other factors of risk for depression are binge drinking in the past 12 months, having an annual family income between \$10,001 and \$20,000 compared to a lower income, being 30-39 years old compared to being 18-29.

Multivariate analyses: employment status and DSM-5 AUD

Employment status is not associated with DSM-5 AUD in the past 12 months. However, those with an "other" religious preference compared to Catholics, as those with a high school diploma and some college education compared to those with college education are protected against DSM-5 AUD. The same is true for those who are older than 40 years of age. Men are more likely than women to be positive for DSM-5 AUD. Binge drinking and the average number of drinks consumed weekly are both factors of risk for AUD. Those who binge at least once in the past 12 months are almost 3 times more likely to be positive for AUD than those who did not binge drink.

Discussion

The analyses in this paper were conducted to assess the extent to which employment status was associated with depression and with different alcohol-related outcomes in Puerto Rico. These associations were confirmed in only a few cases. The bivariate results show that among men, employment status is only associated with depression. One in five men who

were unemployed are depressed. Among women, employment status is associated with depression, and current drinking status. In most of these analyses, unemployed women have higher rates of these outcomes than women who are working or women who are not in the workforce. The gender specificity of these findings confirms other results on the effects of unemployment on health and drinking (Mossakowski, 2009;Lahelma et al., 1995). There still are substantial differences in the way men and women drink alcohol, in spite of recent indications that the gender gap in drinking might be closing (see, for instance, (Dawson et al., 2015;Keyes et al., 2011), and employment status can have a different impact on gender roles.

The multivariate results, controlling for a number of potential confounders, confirm some of the bivariate results. Perhaps the most interesting finding in the paper is the strong effect modification of gender on the association between employment status and depression in Puerto Rico. The effect indicates that although the main effect of male gender is protective against depression, when men are only employed part-time, their odds of being depressed increases almost fivefold compared to employed women. Also, the bivariate analysis (Table 1) shows that male unemployment is a factor of risk for depression, while the multivariate analysis (Table 5) shows that male gender has a protective effect against depression. This difference in effect is because in Table 1 the comparison for unemployed males are other males in different categories of the employment status variable, while in the multivariate analyses the comparison of the main effect of male gender is female gender. Second, it is possible that the association between part-time employment and depression for men occurs because some of the men who are employed part-time want to work fulltime and cannot find such jobs. Unfortunately, the number of individuals in this category, which the US Department of Labor refers to as underemployed, was too small to support separate analyses. This result is also connected with the important role that employment plays in men's identity in life. It confirms several results in the literature linking unemployment and underemployment to depression (Mossakowski, 2009;Dooley et al., 2000).

Previous papers in the literature have not found an effect modification by gender on the association between employment status and psychological distress (Catalano et al., 2011;Hammarstrom et al., 2011;Mossakowski, 2008;Rugulies et al., 2010). Many of these papers were longitudinal studies, and at least two were in countries other than the U.S. (Sweden and Denmark), which could explain the difference in results between these papers and the finding reported here in. In contrast, several studies have reported age-related variations in the association between employment status and depression (Mossakowski, 2009;Bor et al., 2013;Ruhm, 1995), which were not found in this paper.

Besides depression, employment status is only associated with drinking status. In this particular case, those not in the workforce are less likely to be drinkers than others. As defined by the U.S. Department of Labor, those not in the workforce include homemakers (mostly women), students, retirees, those who are incapacitated to work and those who have never worked. The group is probable a mixture of men, women, older, and younger individuals. But given that the effect of gender, age, marital status, religion and income are controlled for in the analysis, these factors are not confounding the association between being out of the workforce and abstaining. These individuals may be non-drinkers for a

variety of reasons, including for instance, more conservative attitudes towards alcohol consumption, and perhaps patterns of social interaction that do not include drinking occasions. They could also abstain from drinking or drink less because of an acute or chronic medical condition that makes it impossible for them to work. In the U.S. one of the main reasons why people abstain is religion (Michalak et al., 2007). Compared to some European countries, where 10% or less of the adult population abstain (Babor et al., 2010), the U.S. abstention rate of about 30% is relatively high. Abstention in Latin American countries is higher than in Europe and more comparable to the U.S. (Babor et al., 2010; Room et al., 2002).

The lack of a wider association between employment status and drinking outcomes in Puerto Rico can perhaps be explained in several ways. First, the alcohol literature is not entirely consistent in reporting positive associations between employment status and drinking. This is most probably a result of societal (e.g., government safety net) and cultural factors (e.g. support of family and friends) that can minimize the bad effects of job loss and economic insecurity and that vary from place to place. Second, Puerto Rico has had a double digit rate of unemployment and underemployment for many years. The recent economic recession that impacted the U.S. and many other economies around the world led to an increase in this rate also in Puerto Rico. However, it is possible that given the chronicity of high unemployment in the island, the impact of the recent rise in rates was minimized by ways that the population developed to cope with constant unemployment. One potential mechanism is reliance on family ties for both psychological and economic support. This may be particularly important in Puerto Rico because by being on an island, Puerto Ricans are by force of geography living relatively close together with family and friends. Also, as a Latin American culture, most Puerto Ricans live within extended families, and this widens the circle of people on whom one can rely. Sabogal et al. (1987) have identified family support and cohesion and one of the core values of societies in Latin American countries. Third, Puerto Rico is a “wet” environment, where drinking is already at a relatively high level that is not affected by employment status. Fourth, it is also possible that chronic unemployment in Puerto Rico has led to the development of an underground economy, so that those officially unemployed are not really so but have jobs that are not part of the formal economy. Finally, because alcohol use is a behavior influenced by the drinkers’ cultural and social environment, it should not be surprising that alcohol’s relation to employment status may or may not be present depending on a number of societal factors that characterize the people and the place of analysis. Some of the covariates in the multivariate analyses were associated with the drinking outcomes examined herein as predicted by previous findings in the literature. Protestant religion, education, and older age were all protective of drinking and or binge drinking (Michalak et al., 2007; Koenig et al., 2011; Wechsler et al., 2002; Hingson et al., 2005).

Having never married was a factor of risk for drinking in general and for having a higher average number of drinks per week. This has been a consistent finding in the literature, usually explained by that fact that those who are younger, as those who are single, and males have a lifestyle characterized by more occasions where drinking occurs and also have more liberal norms and attitudes about drinking.

In conclusion, employment status in Puerto Rico is associated with depression and with current drinking status, but not with other alcohol-related outcomes. Perhaps the main finding in the paper is the strong interaction between male gender and employment status, which leads to a four-fold increase in the likelihood of depression for men who are employed part-time, and a three-fold increase for those who are unemployed, although this latter finding did not reach statistical significance. This finding has direct relevance to prevention and clinical actions designed to respond to the ill health effects of unemployment, such as depression, especially among men. Prevention, increased access to clinical services to address depression and increased vigilance to the effect of depression may also prevent another effect of loss of job and economic adversity, suicide (Nandi et al., 2012;Kaplan et al., 2015). Future research should focus on a better understanding of the underground economy that may exist in Puerto Rico. This may change the meaning of official categorizations of employment status, i.e., unemployment may really mean lack of a formal job and not really lack of a job. The protective role of familial cohesion and support in Puerto Rico, which has been described as a core value of Latino culture, should also be investigated, and will be the subject of future analyses of this survey. Family support may be a protective factor against heavier drinking and alcohol-related problems for those who are unemployed.

Strengths and Limitations

The study has many strengths. It is based on analyses of a random sample of the adult population of San Juan, which was interviewed face-to-face in a survey with a particularly high response rate of 83%. Data collection covered several drinking outcomes in detail and used state of the art interviewing techniques and questions. Data analyses took into account important confounders of the association between unemployment and drinking such as gender, age and income, some of which (e.g., income) had not been controlled in some previous analyses in the literature.

The study also has limitations. Data collection was based on self-reports, which may lead to under-reporting of alcohol consumption and other information. The study design was cross-sectional, which does not allow for assessments of temporal associations, and does not allow for evaluating reverse causation in the association between unemployment and drinking. Alcohol-related downward social drift (Dohrenwend et al., 1992;Mossakowski, 2008) from higher to lower socioeconomic status due to heavier drinking and alcohol problems can lead to work problems, underemployment and unemployment (Mullahy and Sindelar, 1996;Sloan et al., 2009).

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Depression, Binge Drinking, and DSM-5 Alcohol Use Disorder by Employment Status Among Men, San Juan, Puerto Rico, 2014; Adjusted proportions.

Table 1

	Unemployed (87)	Employed part-time (107)	Employed full-time (323)	Not in workforce (177)	Total (694)
Depression ***	21%	13%	4%	9%	9%
Drinker	68%	79%	75%	74%	74%
Binge at least once in past 12 months	27%	32%	25%	26%	27%
DSM-5 AUD, past 12 months	17%	21%	11%	14%	14%

Notes: Parentheses indicates the number of men in the sample in each category of employment in the analysis;

p < 0.001.

Depression, Binge Drinking, and DSM-5 Alcohol Use Disorder by Employment Status Among Women, San Juan, Puerto Rico, 2014: Adjusted proportions.

Table 2

	Unemployed (98)	Employed part-time (116)	Employed full-time (296)	Not in workforce (212)	Total (814)
Depression **	18%	7%	9%	21%	13%
Drinker **	60%	70%	70%	51%	63%
Binge at least once in past 12 months	24%	18%	18%	13%	17%
DSM-5 AUD, past 12 months	10%	10%	6%	4%	7%

Notes: Parentheses indicates the number of women in the sample in each category of employment in the analysis;

**
p < 0.01.

Table 3

Logistic Regressions Predicting Drinking Status and Binge in the Past 12 Months

	Current Drinker		Binge at least once past 12 months	
	OR	95% CI	OR	95% CI
Employment Status (Ref: Employed full-time)				
Unemployed	0.84	0.47-1.48	1.15	0.63-2.10
Employed part-time	1.13	0.70-1.82	0.90	0.54-1.49
Not in workforce	0.63 *	0.42-0.96	0.62 *	0.39-0.97
Religion (Ref: Catholic)				
Protestant	0.37 ***	0.28-0.49	0.69	0.47-1.00
Other religious preference	0.67	0.32-1.38	1.02	0.51-2.04
No religious preference	1.32	0.88-1.97	1.46 *	1.03-2.09
Income (Ref: \$0-\$10,000)				
\$10,001-\$20,000	0.83	0.55-1.25	0.99	0.62-1.58
\$20,001-\$30,000	1.07	0.68-1.70	0.87	0.54-1.39
\$30,001-\$40,000	0.91	0.55-1.49	0.83	0.45-1.54
\$40,001-\$60,000	1.66	0.92-3.01	0.74	0.43-1.27
\$60,001+	2.17	0.94-5.02	0.69	0.36-1.33
Education (Ref: College degree)				
Less than high school	0.41 ***	0.26-0.65	0.88	0.48-1.61
High school diploma	0.48 **	0.30-0.75	0.88	0.54-1.43
Some college/technical/vocation	0.81	0.57-1.16	1.01	0.71-1.44
Marital Status (Ref: Married/living with someone)				
Married not living with spouse/legally separated/divorced	1.36	0.98-1.91	0.80	0.50-1.26
Widowed	0.79	0.36-1.73	0.75	0.23-2.49
Never married	1.63 **	1.15-2.30	1.15	0.81-1.63
Age (Ref: 18-29 years)				
30-39 years	0.53	0.31-0.88	0.79	0.53-1.18
40-49 years	0.35	0.21-0.57	0.32 ***	0.19-0.51
50+ years	0.36	0.23-0.57	0.51 **	0.33-0.81

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Gender (Ref: Female)	Current Drinker		Binge at least once past 12 months	
	OR	95% CI	OR	95% CI
Male	2.00 ***	1.53-2.60	1.69 ***	1.29-2.20

Notes:

Current drinkers are respondents who consumed at least one standard drink in the past 12 months.

* < 0.05;

**

p < 0.01;

p < 0.001.

Table 4

Linear Regression Predicting Weekly Average Number of Drinks (logarithmic transformation)

	Coefficient	SE	95% CI
Employment Status (Ref: Employed full-time)			
Unemployed	-0.02	0.13	-0.30 0.24
Employed part-time	0.08	0.11	-0.14 - 0.30
Not in workforce	-0.20	0.11	-0.42 - 0.01
Religion (Ref: Catholic)			
Protestant	-0.29 **	0.09	-0.47 - -0.10
Other religious preference	-0.20	0.14	-0.49 - 0.08
No religious preference	0.24 *	0.10	0.05 - 0.44
Income (Ref: \$0-\$10,000)			
\$10,001-\$20,000	-0.06	0.11	-0.28 - 0.16
\$20,001-\$30,000	0.09	0.13	-0.16 - 0.35
\$30,001-\$40,000	0.03	0.16	-0.28 - 0.34
\$40,001-\$60,000	0.07	0.16	-0.24 - 0.38
\$60,001+	0.20	0.17	-0.14 - 0.53
Education (Ref: College degree)			
Less than high school	-0.14	0.14	-0.42 - 0.14
High school diploma	-0.13	0.10	-0.33 - 0.08
Some college/technical/vocation	-0.01	0.07	-0.16 - 0.13
Marital Status (Ref: Married/living with someone)			
Married not living with spouse/legally separated/divorced	0.12 ***	0.09	-0.07 - 0.30
Widowed	-0.03	0.18	-0.38 - 0.33
Never married	0.15	0.08	-0.01 - 0.30
Age (Ref: 18-29 years)			
30-39 years	-0.13	0.11	-0.35 - 0.08
40-49 years	-0.51 ***	0.10	-0.71 - -0.30
50+ years	-0.34 **	0.10	-0.54 - -0.13
Gender (Ref: Female)			
Male	0.58 ***	0.08	0.42 - 0.75

Notes: Ref. = Reference group; SE = Standard error; CI = Confidence interval;

*
p < 0.05;**
p < 0.01;***
p < 0.001.

Table5

Logistic Regressions Predicting Depression and DSM-5 AUD in the Past 12 Months

	Depression		DSM-5 AUD 12 Months	
	OR	95% CI	OR	95% CI
Employment Status (Ref: Employed full-time)				
Unemployed	1.41	0.66 - 3.02	1.43	0.56 - 3.67
Employed part-time	0.61	0.21 - 1.79	1.74	0.85 - 3.56
Not in workforce	2.17 *	1.03 - 4.57	1.36	0.64 - 2.91
Gender × Employment (Ref: Female, Employed full-time)				
Unemployed, male	3.10	0.98 - 9.75	N/A	N/A
Employed part-time, male	4.66 *	1.25 - 17.38	N/A	N/A
Not in workforce, male	0.94	0.30 - 2.99	N/A	N/A
Religion (Ref: Catholic)				
Protestant	1.05	0.69 - 1.61	1.15	0.64 - 2.08
Other religious preference	2.20	0.97 - 5.02	0.62	0.15 - 2.55
No religious preference	1.20	0.67 - 2.16	1.50	0.85 - 2.62
Income (Ref: \$0-\$10,000)				
\$10,001-\$20,000	0.49 *	0.28 - 0.88	0.99	0.53 - 1.83
\$20,001-\$30,000	0.67	0.38 - 1.19	0.84	0.37 - 1.92
\$30,001-\$40,000	0.50	0.24 - 1.08	0.82	0.36 - 1.88
\$40,001-\$60,000	0.47	0.19 - 1.13	0.78	0.35 - 1.77
\$60,001+	0.29	0.06 - 1.39	0.33	0.08 - 1.36
Education (Ref: College degree)				
Less than high school	1.49	0.83 - 2.65	0.32	0.08 - 1.28
High school diploma	0.99	0.57 - 1.69	0.39 **	0.21 - 0.73
Some college/technical/vocation	0.91	0.56 - 1.48	0.58 *	0.37 - 0.91
Marital Status (Ref: Married/living with someone)				
Married not living with spouse/legally separated/divorced	1.43	0.88 - 2.34	0.98	0.45 - 2.11
Widowed	1.76	0.62 - 4.97	0.95	0.10 - 9.21
Never married	1.17	0.70 - 1.96	0.84	0.52 - 1.35
Age (Ref: 18-29 years)				
30-39 years	2.67 **	1.37 - 5.22	0.66	0.36 - 1.19
40-49 years	1.83	0.85 - 3.91	0.43 *	0.22 - 0.85
50+ years	1.63	0.91 - 2.93	0.32 **	0.16 - 0.61
Gender (Ref: Female)				
Male	0.32 **	0.14 - 0.73	1.71 *	1.07 - 2.73
Binge Drink in Past 12 Months (Ref: No binge)				
	1.96 **	1.23 - 3.14	2.76 ***	1.70 - 4.46
Average Number of Drinks per Week				
	1.01	1.00 - 1.02	1.05 ***	1.03 - 1.07

Notes: OR = Odds ratio; CI = Confidence interval; Ref. = Reference group;

N/A = Not applicable.

*
< 0.05;

**
p < 0.01;

p < .001;

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